

PRM021N06N5

PFC Device Corporation

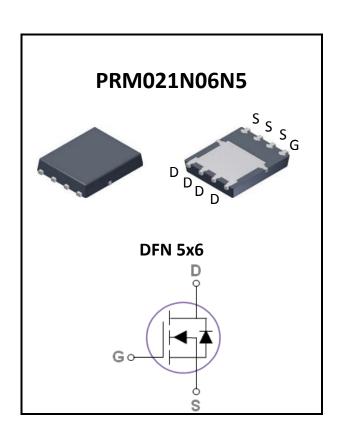
60V Single N-Channel MOSFET

Major ratings and characteristics

Characteristics	s Values	
V_{DS}	60	٧
I _D (T _C =25°C)	30	Α
Max. R _{DS(ON)}	21	mΩ
T _J Operating Junction Temperature	-55 to +150	°C

General Description

The N-Channel enhancement mode power field effect transistor is using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. The device is well suited for high efficiency fast switching applications.



Typical Applications

- Charger Adapter
- Power Tools
- LED Lighting

Features

- Max. $R_{DS(ON)}=21m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% E_{AS} Guaranteed
- Green Device Available

1. Characteristics

Maximum Ratings Characteristics

($T_A = 25$ °C unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
	Drain Current – Continuous (T _C =25°C)	30	Α
I _D	Drain Current – Continuous (T _C =100°C)	19	Α
I _{DM}	Drain Current – Pulsed ¹	80	Α
E _{AS}	Single Pulse Avalanche Energy ²	12	mJ
I _{AS}	Single Pulse Avalanche Current ²	16	Α
ь	Power Dissipation (T _C =25°C)	37	W
P _D	Power Dissipation – Derate above 25°C	0.3	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
TJ	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Тур.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient		62	°C/W
$R_{ heta JC}$	Thermal Resistance Junction to Case		3.3	°C/W



Version 4.1 2 / 8

Electrical Characteristics

(T_J = 25 °C unless otherwise specified)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60			V
1	Danie Course Looks as Course	V _{DS} =60V, V _{GS} =0V, T _J =25°C			1	uA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V, V _{GS} =0V, T _J =125°C			250	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA

On Characteristics

R _{DS(ON)} Static Drain-Source On-Resistance	V_{GS} =10V, I_{D} =15A		17	21	mΩ	
$R_{DS(ON)}$		V_{GS} =4.5V, I_D =8A		20	24	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	1.8	3.0	V
g_{fs}	Forward Transconductance	V _{DS} =5V, I _D =20A	-	50		S

Dynamic and switching Characteristics

Qq	Total Gate Charge		 20	
Q_{qs}	Gate-Source Charge	V_{DS} =30V, V_{GS} =10V, I_{D} =20A	 4.6	 nC
Q_gd	Gate-Drain Charge		 3.2	
$T_{d(on)}$	Turn-On Delay Time		 11	
T _r	Turn-On Rise Time	V_{DD} =30V, V_{GS} =10V, R_G =6 Ω I_D =20A	 80	 ns
$T_{d(off)}$	Turn-Off Delay Time		 25	 115
T_f	Turn-Off Fall Time		 86	
C _{iss}	Input Capacitance		 1200	
C _{oss}	Output Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	 100	 pF
C _{rss}	Reverse Transfer Capacitance		 65	
R_{g}	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	 2.8	 Ω

Drain-Source Diode Characteristics

V_{SD}^{3}	Source to Drain Diode Voltage	V_{GS} =0V, I_{S} =20A	 	1.5	V
t _{rr}	Reverse Recovery Time	1 -20	 5		ns
Q_{rr}	Reverse Recovery Charge	I _S =20A, di/dt=100A/us	 0.5		nC

Note:

- 1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
- 2. V_{DD} =50V, V_{GS} =10V, L=0.1mH, I_{AS} =16A, R_{G} =25 Ω , Starting TJ=25 $^{\circ}$ C
- 3. The data tested by pulsed, pulse width \leq 300us, duty cycle \leq 2%.

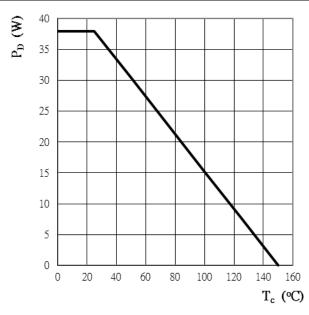


Version 4.1 3 / 8

2. Characteristics Curves

Ratings and Characteristics Curves

(T_A = 25° unless otherwise specified)



35 30 25 20 15 10 5 0 25 50 75 100 125 150 T_c (°C)

Figure 1: Power Dissipation

Figure 2: Continuous Drain Current vs. T_C

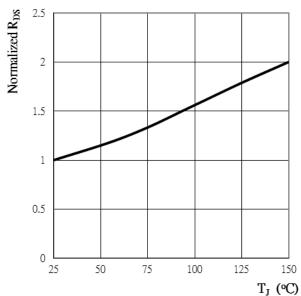


Figure 3: Normalized RDSON vs. T_J

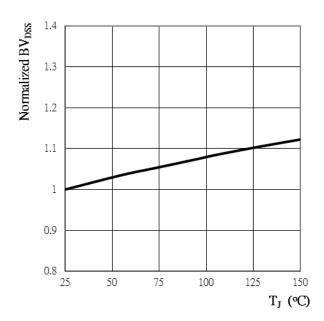


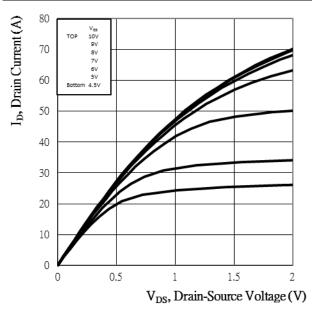
Figure 4: Normalized BVDSS vs. T_J



Version 4.1 4 / 8

Ratings and Characteristics Curves

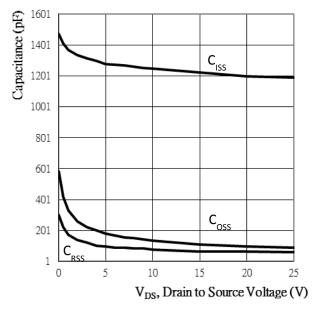
(T_A = 25° unless otherwise specified)



RDS(ON) (m\O), Drain-Source On-Resistance V_{cs} 10V 9V 8V 7V 6V 5V 4.5V 90 80 70 60 50 40 30 20 10 0 0 20 40 I_D, Drain Current (A)

Figure 5: On-Region Characteristics

Figure 6: Typ. RDS Variation vs. I_D and V_{GS}



None of the control o

Figure 7: Typ. Capacitance Characteristics

Figure 8: Typ. Gate Charge Characteristics



Version 4.1 5 / 8

Ratings and Characteristics Curves

(T_A = 25°C unless otherwise specified)

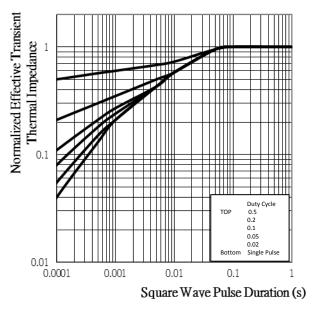


Figure 9: Normalized Thermal Transient Impedance, Junction-to-Case

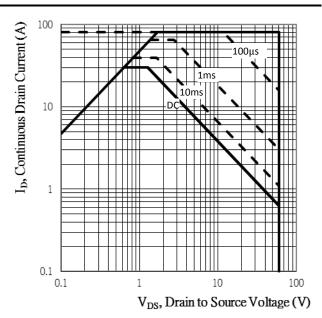


Figure 10: Maximum Safe Operation Area



Version 4.1 6 / 8

3. Marking information

Top Marking Rule

PFC PRM
021N06N5
YYWW ABSH

PRM021N06N5 = Product Type Marking Code

YYWW = Date Code

YY = Last two digits of year

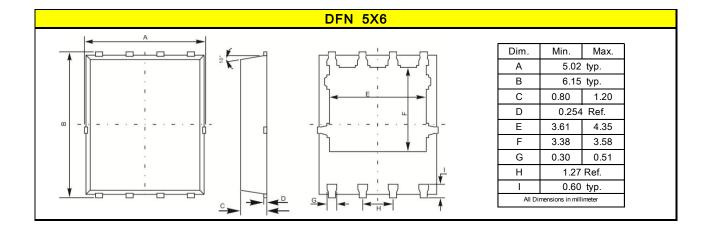
WW = Week code

ABS = Assembly code

H = Halogen Free (N/A = common molding compound)

4. Package information

Package Outline Dimensions millimeters





Version 4.1 7 / 8

5. Ordering information

Part Number	Package	Delivery mode
PRM021N06N5	DFN 5X6	3000 pcs / 13" diameter reel

Mechanical

Molder Plastic: UL Flammability Classification Rating 94V-0
 Device Weight: 0.003 ounces (0.093grams) – DFN 5X6

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Version 4.1 8 / 8